

## Abstract of the Disclosure

The present invention provides a method for forming a capacitor in a semiconductor device. Particularly, an aluminum oxide ( $\text{Al}_2\text{O}_3$ ) layer deposited by using an atomic layer deposition (ALD) process is used for the capacitor. The inventive method for forming the capacitor, including; forming a lower electrode constituted with a poly-silicon layer on a semiconductor substrate a predetermined process on which a predetermined process has been completed; forming a uniform silicon oxide layer on the lower electrode; forming an aluminum oxide ( $\text{Al}_2\text{O}_3$ ) film on the silicon oxide layer by performing an atomic layer deposition (ALD) process; and crystallizing the  $\text{Al}_2\text{O}_3$  film by carrying out a heat treatment process.